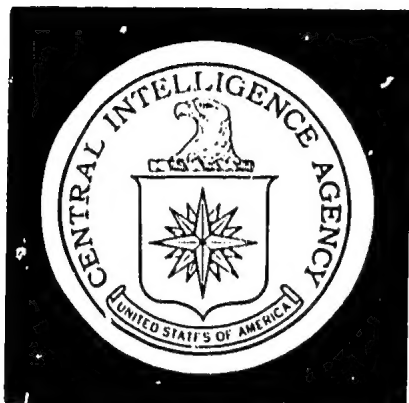


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DIRECTORATE OF
INTELLIGENCE

Intelligence Memorandum

The Kama Truck Project: Plans, Progress, And US Participation

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CENTRAL INTELLIGENCE AGENCY
Directorate of Intelligence
July 1971

INTELLIGENCE MEMORANDUM

THE KAMA TRUCK PROJECT:
PLANS, PROGRESS, AND US PARTICIPATION

Introduction

1. The persistent efforts of the USSR during the past two years to enlist the help of Western truck building firms and, in particular, to obtain some items of eagerly sought after US machinery and technology for the Kama truck project, appear to be paying off. Under the terms of an interim agreement signed by Mack Trucks, Inc., and the USSR Ministry of Foreign Trade, Mack has contracted, subject only to the issuance of export licenses by the US government, to provide substantial engineering services for Kama. The giant Kama truck plant, now under construction, is the keystone of Soviet plans to modernize the Soviet transportation system by moving more commercial freight between cities and over short hauls by truck instead of rail. The heavy diesel trucks to be built at Kama are designed to handle cargo weights up to 20 tons over primary and secondary road systems.

2. The purpose of this memorandum is to discuss Soviet plans for the production of trucks at Kama, Mack's projected role in the project, the potential for US participation, and the Soviet need for trucks of the type to be built at Kama.

Discussion

General

3. The Kama Truck Plant (officially designated the Kama Motor Vehicle Plant, KamAZ), now being constructed at Naberezhnyye Chelny

Note: This memorandum was prepared by the Office of Economic Research.

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on the Kama River, an eastern tributary of the Volga, is the largest known Soviet construction project of the Ninth Five-Year Plan (1971-75). The plant is designed to produce 150,000 heavy diesel trucks a year, a rate of output that exceeds that of any single plant for large-size trucks in the West.

4. The layout of the plant includes separate buildings for the six main production shops: (1) forging, (2) foundry, (3) stamping and pressing, (4) engine, gear, and transmission, (5) assembly, and (6) tooling and repair. Construction has been under way for about 18 months. Ground preparation at the 36 square mile site began in late 1969 or early 1970, and construction proceeded rapidly on road and rail facilities, support structures, and on permanent housing for workers. Recent reports on the state of construction indicate that some work is being done on at least half of these shops. The tool and repair shop is furthest along; the foundry is under construction; and the powerplant is being built.

5. The original Soviet plan called for completion of the plant and maximum production by 1975. However, that plan has been set back, principally because a worldwide search for technical and financial assistance has been more protracted and difficult than anticipated. The plant probably will not be completed before the end of 1976, and maximum output of 150,000 trucks a year cannot realistically be expected before the late 1970s.

6. Soviet officials estimate the total cost at 3 billion rubles, but a large share of that amount is being spent on the construction of the physical plant and support facilities probably including housing. Up to one-third, perhaps a billion dollars (rubles) 1/ may be spent in the West for licenses, technology, and equipment. It is likely that at least \$140 million will be spent in the United States if licenses are obtained. That figure represents technology and equipment at the highest level of the art that is available only in the United States.

Search for Western Assistance

7. During the past two years the Soviets have contacted automotive firms throughout the industrial West: Ford and Chrysler in the United States, British Leyland in the United Kingdom, Daimler-Benz in West Germany, Renault and Berliet in France, FIAT in Italy, Volvo of Sweden, and Isuzu, Hino, and Toyota of Japan. By mid-1970, negotiations had narrowed to Daimler-Benz and Renault. After numerous high-level bargaining sessions, however, Daimler-Benz declined the role of major engineering consultant, and eventually offered only to sell the licenses for its truck engines. Negotiations foundered mainly on disagreement over price.

1. *Assuming a 1:1 ruble-dollar ratio for the cost of automotive production machinery manufactured in the United States and in the USSR.*

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Renault now is the only West European firm carrying a major supporting role for Kama. Under cooperative arrangements already in effect, Renault is being counted on to supply production equipment and technology for building truck cabs and to assist the USSR in purchasing machinery in Western Europe. A purchasing commission of several hundred Soviets is currently being established in Paris.

8. After the Daimler-Benz deal stalled, the Soviets wasted little time in making their next move toward getting Western assistance. Soviet officials took advantage of an invitation made earlier by SATRA Corporation (the New York trading firm representing Mack Trucks, Inc. and other interested US companies) to visit Mack and other firms in the United States who want to sell truck technology and equipment to the USSR for Kama and other automotive plants. Within a few weeks the USSR put together a high-level delegation of 14 officials, including a number of deputy ministers and chiefs of main administrations and arranged for negotiations with the US firms and for discussions with officials of the US government. The mission of the delegation clearly was to make proposals attractive enough to influence a change in US export policy. On 18 May 1971 a protocol was executed between Mack Trucks, Inc., and representatives of the USSR Ministry of Foreign Trade which provides for extensive participation by Mack in the Kama plant project.

Mack's Role

9. Mack Trucks, Inc., is prepared to assume substantial engineering and management responsibilities for the design and equipment of the Kama plant. According to the protocol, Mack will be the primary, perhaps sole, procurement agency for all equipment purchased in the United States, will supervise the on-site installation in the USSR of US-origin equipment, and will act as principal consultant for engineering services. Services will include designing the equipment layouts and specifying the machinery for three of the six major facilities at Kama: the forge, the engine plant, and the assembly facility. Mack will also purchase equipment for the foundry. The foundry design will be supplied by the US firm Swindell-Dressler. In addition, Mack will design a data processing system for production management (using Soviet computers) and will supply shop layout and production equipment for major engine-related parts: crankshafts, camshafts, and timing gears, as well as rear axles. Virtually all of these plans are subject to Mack obtaining the necessary export licenses.

10. Although Mack will specify equipment for major portions of the Kama plant, and can recommend suppliers, the Soviets have kept their options open and retain the right to buy or not buy in the United States the equipment which Mack recommends. Hence, Mack's important role in the Kama project will not necessarily generate a large number of follow-on orders for other US firms.

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Potential US Sales

11. Much of the technology and equipment for the production of trucks at the Kama plant will come from Western Europe and the United States. The USSR will provide most of the equipment for only one of the production facilities, the tooling and repair shop. For the most part, only standard, non-specialized machine tools are required for that facility.

12. Although a large share of the major items of machinery and equipment for Kama probably will be purchased outside the USSR, it is not known what the total dollar value of such purchases will be. The SATRA Corporation has estimated potential US sales, including fees for management and technical services, at \$750 million. No specific licensing applications have yet been submitted, however, and the figure of \$750 million bears no necessary relationship to the eventual total of those applications. Some of the orders for equipment probably will be filled by US subsidiaries and licensees in Western Europe.

13. If export licenses are granted, the USSR almost certainly will purchase a substantial volume of US-manufactured plant equipment. The Soviets are particularly anxious to procure certain items of American foundry equipment and specialized machine tools for automotive production which represent the latest technology and are available only in the United States. The following expenditures in the United States, totaling about \$140 million, appear certain: management fees (Mack), \$50 million plus; technical fees for the layout of the foundry (Swindell-Dressler), about \$15 million; equipment for the foundry, \$20 million plus; machine tools for crankshafts, camshafts, and timing gears, possibly \$40 million; and gearcutting machine tools (Gleason), \$15 million plus. Payment for these purchases will be in cash. The project has not yet been developed in detail, and it is likely that expenditures in the United States could be greater, perhaps as high as \$200 million.

14. In addition to purchases of equipment and technology directly related to the Kama project, the Soviets have stated a willingness to buy some heavy trucks and production machinery for consumer goods as an added inducement to the United States to grant approval of export licenses for Kama. The Soviets are prepared to buy 50 large (75 and 100 ton) off-highway trucks for mining purposes valued at \$11 million, in exchange for an equivalent amount of nickel. They may wish to order an additional 50 trucks of the same type valued at \$11 million, possibly with payment in dollars. The Soviets have made no written commitment for either purchase. The protocol signed by Mack and the USSR stipulates only that "the parties agree to consider the possibility of supplying by Mack Trucks,

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Inc., to the USSR of fifty trucks in exchange for electrolytic nickel." Such purchases would not be unreasonable since the Soviets are only in the early stages of developing large (over 50-ton load capacity) off-highway quarry and mining trucks.

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15. According to Deputy Ministry of Foreign Trade N.D. Komarov the Soviets are prepared to spend up to \$1 billion on US machinery for the production of consumer goods. No time period for such purchases has been specified, however. There is no denying the Soviet need for modern machinery for consumer goods, and the importing of such machinery would be more consistent with Soviet policy than would be the importing of consumer commodities. The statement greatly exaggerates, however, the amount of foreign exchange the Soviets are willing to devote to consumer goods industries.

The Kama Trucks

16. The Kama plant will build 3-axle (6 x 4) 2/ trucks, in three basic variants and at the following rates when maximum output levels are reached: (1) a truck with a standard body (stake and platform) which also can pull a trailer, combined carrying capacity of 16 tons - 30,000 units a year and its variant with an extended chassis, 25,000 units a year; (2) a truck tractor for pulling a semitrailer carrying up to 20 tons - 55,000 units a year; (3) a dump truck with a carrying capacity of 7 tons - 40,000 units a year (see Figure 1).

17. The Kama trucks reportedly will use diesel engines of Soviet design rated at 160, 210, and 260 horsepower. Probably the fourstroke cycle, direct injection engines developed by the Yaroslavl Engine Plant and now in use in the trucks produced in Kremenchug will be used. Reportedly, the engine performs well, but it has substantial defects, including excessive weight, excessive tolerances between moving parts, inferior metallurgy, and high fuel consumption. These problems can be alleviated with the assistance of experienced Western engine specialists.

18. Mack Trucks, Inc., is probably as well qualified as any US manufacturer to assist the Soviets in improving their engines. The Mack Thermodyne engine employs a similar combustion system, similar piston and connecting rod design, and generally similar layout of crankcase block and head. Modern US foundry practice will reduce the engine's weight,

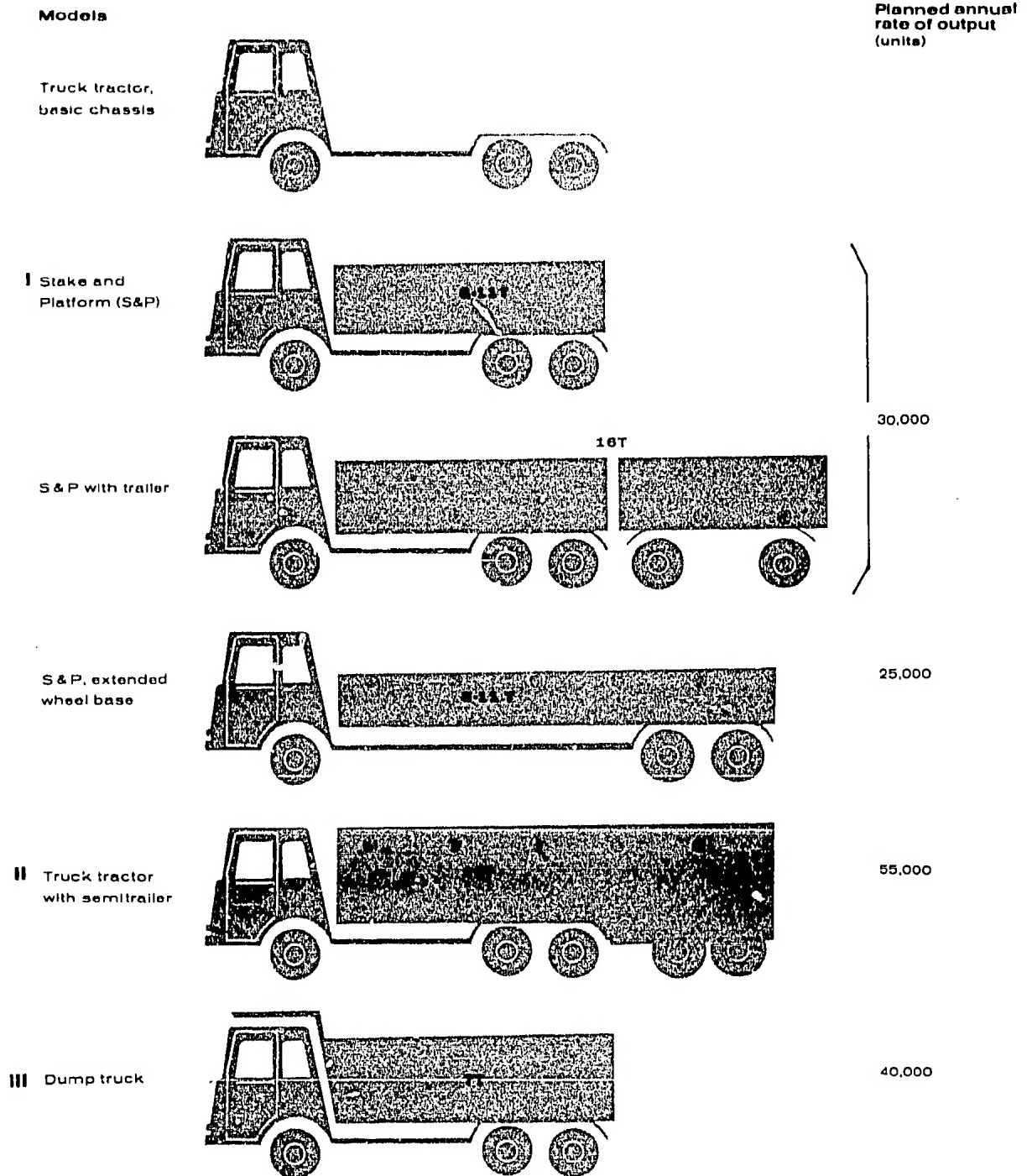
2. *The first figure states the number of wheels and the second figure states the number of wheels that will be powered.*

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Figure 1

Three Basic Models of Trucks to be Produced at KamAZ



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and modern US machine tools can improve the tolerances and surface finish of the moving parts.

19. Planned production at the Kama plant is about 250,000 engines a year. Many of these engines will go into trucks manufactured at other automotive plants in the USSR. Moreover, Soviet negotiators are currently dickering with the West German firm of Kloeckner Humboldt-Deutz (KHD) for technology to produce air-cooled diesel engines at the rate of 50,000 a year, and some of these may be intended for Kama trucks.

Economic Need for the Kama Trucks

20. The trucks to be produced at Kama will be suitable for several important economic applications: the truck tractors with semitrailers are needed to relieve Soviet railroads from the burden of short-distance, intercity freight hauling; the stake and platform model will be suitable for hauling general cargo, including grain and other agricultural crops; and the dump model is urgently required for transporting heavy construction materials such as earth and gravel.

21. The USSR has a pressing requirement for trucks with larger carrying capacity than those now standard in the common carrier park. At present, there are about 5 million trucks in the inventory, but relatively few of these are 3-axle heavy cargo trucks of the type to be built at Kama. The average load carrying capacity of the Soviet common carrier truck fleet is now about 4 tons, and most of the 500,000 to 600,000 trucks being built each year are in this range (see the table and Figure 2). In order to reduce highway transport costs and to reduce the requirement for hiring and training drivers, the USSR must raise the average carrying capacity of its trucks.

22. Moreover, the 3-axle trucks that are now being produced in the USSR do not meet the requirements of the existing road system. The Soviet motor vehicle industry now produces 3-axle (6 x 4) trucks at Kremenchug, the KrAZ-258, which have about the same cargo capacity as those designed for the Kama plant. However, the Kremenchug 6 x 4 trucks are adaptations of heavy duty all-wheel-drive trucks initially designed as tactical military vehicles. The rugged construction necessary in a tactical vehicle results in a very heavy chassis and a reduced payload/empty weight ratio. The axle load imposed on the road by the KrAZ-258 is nearly 10 tons per axle. In effect, this means that KrAZ trucks cannot be used on most of the Soviet highway system. Only 75,000 kilometers of roadway in the USSR, out of a total of about 1.4 million kilometers, can support 10-ton axle loads. The rest of the highway system, because of weak surfaces and low capacity bridges, limits axle loads to about 6 tons. The trucks to be

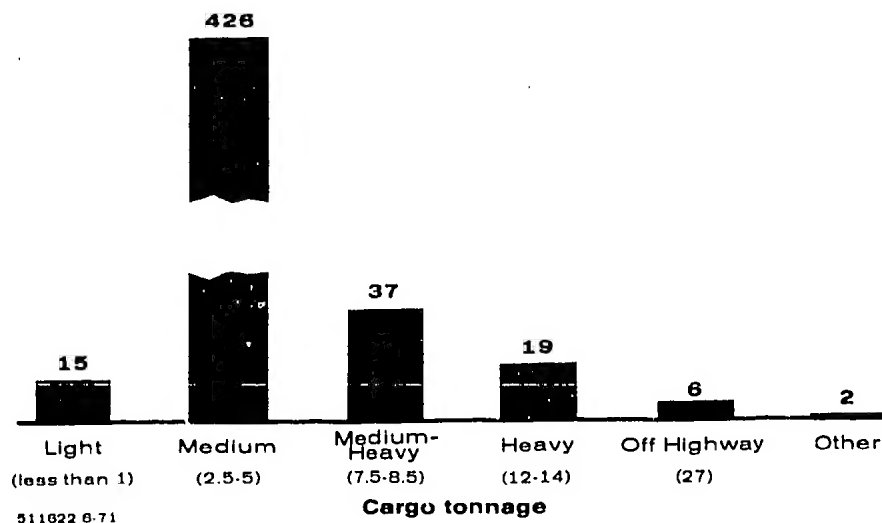
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<u>Year</u>	<u>Thousand</u>	<u>Year</u>	<u>Thousand</u>
1960	362	1966	408
1961	382	1967	437
1962	382	1968	478
1963	382	1969	504
1964	385	1970	525
1965	380	1975 Plan	790

Figure 2**Soviet Production of Trucks by Class Size, 1969**

Thousand units

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produced at Kama, on the other hand, because of their excellent payload/empty weight ratio, will be able to carry large payloads over the entire highway system.

Strategic Significance of Kama Trucks

23. The military forces of the USSR hold about 4% of current truck inventory. Because of the general shortage of all-wheel-drive trucks, the military motor pools contain many general-purpose and conventional-drive vehicles. During periods of military mobilization, such as occurred during the invasion of Czechoslovakia in 1968, some vehicles of civilian motor vehicle parks are diverted to military uses.

24. Some of the Kama trucks could also end up in military motor pools. They could effectively transport heavy cargo between military commands headquartered in Soviet cities or between the USSR and Soviet forces in Eastern Europe. Alternatively, and more probably, the applications of Kama trucks to civilian industrial and agricultural uses will release more of the output of the other truck plants for the production of trucks with military characteristics.

25. In any case, the 3-axle trucks that the USSR plans to produce at the Kama Motor Vehicle Plant are not tactical military vehicles. Although some of them may eventually be fitted with front wheel drive, giving them a 6 x 6 wheel formula for better traction in muddy or icy environments, most will be of the 6 x 4 wheel formula which is standard for 3-axle commercial trucks. Moreover, it does not seem likely that these trucks will be equipped for deepfording or for control of tire pressure by the driver, both characteristics of the ZIL-131 trucks that are produced at the Moscow Likhachev Plant (ZIL) and for which licenses to export production equipment recently have been issued. 3/

Summary

26. The Kama plant, the largest single industrial construction project of the present Five-Year Plan (1971-75) will build 3-axle heavy diesel trucks in the 7- to 20-ton range. These trucks are not designed as tactical military vehicles. They could, however, be used for moving general cargo or military support equipment to military bases in the USSR or Eastern Europe.

3. *In May the United States approved \$88 million of orders outstanding for machinery to other Soviet truck building plants, including ZIL.*

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27. During the past two years, the USSR approached several US, West European, and Japanese firms for help in designing and equipping the Kama plant. None was willing to assume a major supervisory role in plant engineering. In May the USSR sent a high-level trade delegation to the United States in a final bid to gain US assistance and technology. The Soviets hope their proposal is attractive enough to bring about a change in US export policy. Under a protocol signed by the USSR and Mack Trucks, Inc., on 18 May 1971, Mack agreed, subject to the issuance of export licenses, to act as procurement agent for equipment purchased in the United States, to supervise the installation of such equipment at Kama, and to be a principal consultant for engineering services.

28. If US export licenses are granted, the USSR will receive substantial technological assistance from US firms for the Kama truck plant. Expenditures in the United States are likely to be at least \$140 million and could reach \$200 million. There could be additional sales by US subsidiaries and licensees abroad. In addition to equipment intended for Kama, the USSR has also offered to buy 50 off-highway trucks from Mack in exchange for nickel and have surfaced the possibility of purchasing machinery in the United States for manufacturing consumer goods. No firm commitments on these offers have as yet been made.

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